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Wendel M. Burkhardt; Robert LeMoyne; Jonathon Ulmer (Advatech Pacific, Inc.), "Graphical User Interface for Controlling the Execution of ROCETS Liquid Rocket Engine Simulations" (abstract only)

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JANNAF December 2003 CS/APS/PSHS/MSS Conference

(Statement A)

(no location provided, December 2003) (Deadline = 10 March 2003 = Past Due)

**December 2003 CS / APS / PSHS / MSS
ABSTRACT SUBMITTAL FORM**

Unclassified Abstract

(250-300 words; do not include figures or tables)

The ROCETS (ROcket Engine Transient Simulation) computer program is a very powerful tool for state-of-the-art modeling and simulation of liquid rocket engines. The versatility and adaptability of this tool makes it ideal for the analysis of any type of liquid rocket engine cycle at any level of modeling detail desired by the user. While these features make ROCETS a very powerful tool, they also make it a very difficult tool for casual users to apply to problems effectively. This problem exists both for the actual development of the computer model as well as the operation of a working model.

This paper describes a novel Graphical User Interface (GUI) developed specifically to address the problem of simplifying the use of working ROCETS models. The GUIs described provide an interface to two specific ROCETS liquid engine models, both using variations of an oxidizer rich staged combustion cycle. The GUIs translate inputs familiar to rocket engineers into inputs suitable for the ROCETS models, freeing the user from performing the numerous tedious calculations required to obtain the hundreds of input parameters needed. The GUI permits users to input top-level parameters such as thrust, chamber pressure, nozzle expansion ratio, inlet pressures, etc. These inputs are then used to resize all of the engine components. In this way, the user is able to resize the engine being considered over a thrust range of 10 Klbf to 2Mlbf. The GUI permits the user to perform trade studies rapidly and assess feasibility of specific design parameters and operating conditions. The interface also has the capability to vary input parameters automatically over a selected range and output the results graphically.

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